

Lawrence Berkeley National Laboratory
Information Systems Program Plan
(FY 2003 – 2006)

Enterprise Computing Steering Committee
(ECSC)

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Enterprise Computing Steering Committee Membership

Diana Brown
Terry Hamilton
David McGraw
Sandy Merola (Chair)
Anil More
George Reyes
Kem Robinson
Randy Scott
Jim Triplett
Bill Wasson

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I. Executive Summary and Overview

Berkeley Lab Operations, via the Enterprise Computing Steering Committee (ECSC), has created this Program Plan to guide the prioritization and funding of Information Systems applications during the next few years. The goal of this initiative is to reduce the Laboratory's overall costs and improve the effectiveness of scientists, managers and operations staff. Best business practices and standardized software will be adopted to provide unified, personal access to integrated institutional information, resources and services.

The result of this program will be that scientists, administrators and managers will have easier and more timely access to all of the institutional information that they need for programmatic and operations management. Besides reducing many of the current labor-intensive processes for collecting, analyzing, and reporting administrative and financial data, these new systems will yield information that is accurate, up-to-date and consistent. This initiative will move the Lab from its current state of gathering and transacting data to a desired state of delivering information to support enterprise-level decision-making.

This will be accomplished on a relatively flat budget of our current annual investment of approximately \$2 million per year for the next three to four years. This ongoing investment will allow the implementation of the 10 strategic projects described in this document. By design, this program provides for a flexible funding profile that allows the managed adjustment of the project scope and deliverables over time. This expenditure is consistent with Berkeley Lab's past information technology (IT) spending levels (see Appendix B), and is far less than the projected costs for similar projects at other UC labs and campuses (see Appendix D and E). This initiative is also expected to result in cost savings similar to those realized from past IT investments (see Appendix C).

While we are pleased to continue the successful track record of information systems projects at Berkeley Lab, we are also introducing a Program Governance and Project Management model that will ensure the return on investment (ROI) necessary to increase our scientific competitiveness. Current best business practice is that for each \$1.5 spent per year on information systems projects, the resultant ongoing savings is \$1 per year. Thus, savings are realized within 1.5 years of project completion. Under this program, no project will be approved or started unless a positive ROI can be forecasted and realized.

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This Program Plan is based on the successful track record of information systems investment over the last decade. We start by providing a short summary of those efforts.

Charting the Course 1992-1995

Berkeley Lab made its first major assessment of institutional systems only about a decade ago. An extensive inventory of LBNL systems for storing and processing financial and administrative data found them to be fragmented, random and often patched together from other institutions, including a handful of legacy applications moved wholly from LLNL. In all, 452 stand alone systems were inventoried across LBNL, some critical to Lab operations. These applications were based on 50 different programming languages and system architectures, many of them no longer supported by vendors.

Despite the critical nature of some of these systems, the resulting data were usually inaccurate, inconsistent and incomplete. Combining or moving data between systems was time-consuming and labor-intensive. It was hard to know where to look for critical information, and it required a leap of faith to have confidence in information that was available. As a result, many organizations created their own “shadow systems” to produce needed data. It was essential that the Lab replace this hodge-podge of standalone systems with applications that delivered reliable, up-to-date information. Furthermore, advances to our business systems environment had to be made before LLNL stopped its support of the legacy applications that were being exported to LBNL.

The IT Shakedown Cruise – 1995-2002

By the mid-1990s, extensive efforts by Lab Administrative, Financial and IT professionals under the leadership of the Deputy Director for Operations led to a multi-year strategic plan to make focused investments in information systems and the underlying infrastructure. Funding was provided on an “as available basis,” but at a high priority given other ongoing operational priorities. The result was a systematic and affordable, albeit somewhat slower than planned, effort to address the myriad technical and functional problems that existed. The strategic plan, which gave focused priority to transaction processing (purchasing, accounts receivables, payroll and benefits, etc.), is now nearing completion. More than 100 activities have been aligned into more systematic processes. The result is a reliable but not yet fully integrated source of administrative and financial data. This has increased the efficiency of HR, Finance and ASD staff, including division business managers. In the process, the majority, but by no means all, of individual divisional systems have been retired.

With the establishment of the Grants Administration and the Travel Management System in FY03, the 1995 Strategic Plan will be completed. For the first time, the LBNL systems environment is now on a par with, if not superior to, comparable environments at other UC labs and campuses. This has been achieved at a fraction of the development and support costs of those other sites. We are proud of this

achievement that has served Berkeley Lab well, and this proposal aims to continue in that extremely cost-effective course.

The Next Leg of the Course – 2002-2005

While LBNL was restructuring its transactional systems, the commercial software industry was busily developing new, more capable applications. The result is that the Lab now has the opportunity to create a program that will result in increased effectiveness and efficiency. When implemented, the projects of this program (see below and Section III) will ensure that the Lab adopts best business practices to provide unified and personalized access to integrated institutional information, resources and services, thus reducing Berkeley Lab's overall costs and improving the effectiveness of scientists, managers and operational staff. The more than 100 processes that have already been aligned into core processes will now be improved and, in some cases, reengineered to eliminate duplication and to increase efficiency, yielding both added value and cost savings to Laboratory divisions.

The planned next generation of LBNL systems will be integrated to maximize data integrity, availability and synthesis. Cost-effective, proactive systemic controls will replace existing manual post-transactional interventions wherever possible. Certified systems will be adopted to simplify work processes. Because best business practices are embedded in the software to be deployed, this will allow Lab information workers to eliminate unproductive and error-prone procedures and adopt new approaches. Business processes, including those that simply respond to DOE requirements, will be converted into aligned activities necessary to provide timely, accurate and complete information to support decision-making. These procedural changes will also eliminate the need to make costly customizations to packaged software (thereby also reducing system maintenance costs).

This Information Systems (IS) initiative, consisting of 10 strategic projects, will provide new information, resources and services; capitalize on prior IT investments; and investigate new ways to meet emerging IT demands.

Deliver new information, resources and services:

- Develop Berkeley Laboratory Information Systems (BLIS)
- Select and implement a product data management system for Engineering

Capitalize on prior IT investments:

- Refine processes for a new suite of integrated Web-based funding/budget, timekeeping and financial systems
- Leverage more capabilities out of PeopleSoft's HR application
- Create an efficient IT application environment
- Upgrade EH&S systems
- Upgrade and expand the use of Maximo
- Select and implement a system for job-applicant tracking

Investigate new ways to meet emerging IT demands

- Evaluate office management systems for the Directorate and Division offices

- Assess content management software for Website development and maintenance

In order to ensure that these projects meet the needs of end users, the project management teams will include staff from organizations throughout the Laboratory. Drawing on this expertise and experience will result in the information, resources and systems needed by - and worthy of - a world-class facility. In the fast-changing world of information management, keeping up during the next three years will be far more critical than during the last ten.

Land ho!

Specifically, the implementation of this initiative will result in a reduction in Berkeley Lab's overall costs, and improved effectiveness of scientists, managers, and operational staff, by adopting best business practices to provide unified and personalized access to integrated institutional information, resources, and systems.

The components of this IS initiative will be accomplished as a cohesive tactical plan. The plan will result in divisions avoiding certain costs by spending less time and money on administrative and financial functions, and by implementing and integrating the best available solutions in modern information technology. This plan, by design, provides for a flexible funding profile that allows the managed adjustment of the project scope and deliverables over time.

Equally important, the program will be managed under a rigorous governance model using a project management approach. Not only will best business practices result from this program but additionally, for the first time at Berkeley Lab, the full spectrum of information systems projects will be managed using best business practices throughout the entire program

II. Strategies for the Future

The strategies outlined below will reduce the Laboratory's overall costs and improve the effectiveness of scientists, managers and operational staff by adopting best business practices to provide unified, personal access to integrated institutional information, resources and services.

Implement best business practices via standard software.

Even though the Laboratory has adopted commercial software packages such as PeopleSoft applications, these have frequently been customized so that previous Lab processes would be preserved. In addition to locking in obsolete processes, these customizations must be continually reviewed before the applications can be upgraded to newer versions (including Web-based versions), thus increasing ongoing system maintenance costs for the life of these applications.

In the future, new package system implementations and existing system enhancement efforts must:

- be considered in the context of continual improvement, in which Lab processes should be modified to fit the best practices design delivered in most software packages, rather than modify the packages to accommodate Lab practices
- aim to minimize customization so that packaged applications do not become unwieldy and expensive to maintain and upgrade.

By adopting standard software and allowing the refinement of more cumbersome processes and practices, we will have an opportunity to rethink and implement more suitable solutions that will stand the test of time and reduce ongoing system maintenance costs.

Optimize processes to achieve the best return on investment.

The process of developing and maintaining the Lab's applications software must assure the best return on investment for Berkeley Lab. This best return can be measured by the overall use and benefit to all Lab constituencies. To achieve the best return, we must:

- ensure that projects are in direct support of LBNL's mission and needs
- ensure that IT and functional organizations collaborate and jointly identify priority projects that will phase out the remaining legacy systems
- increase end-user participation in system activities
- build stronger and more defined partnerships among central functional and IT organizations and scientific division users
- strengthen project oversight, project management and change control.

Capitalize on past IT investments.

Significant capabilities of our already implemented software packages (including PeopleSoft applications) have not yet been enabled. Thus, some of the activities now performed manually could easily become automated. We must identify opportunities for deploying uninstalled software components and activating unused system functionality for the benefit of LBNL as a whole. Of course, this can only proceed by revisiting each particular business process and validating the business decisions underlying the early decisions. Our approach will:

- determine which software components not currently in use should be installed
- leverage more functionality out of core applications to serve scientific divisions' needs
- streamline business processes and reduce technical complexity to make it easier for end users to get the information they need
- add necessary controls but do not destroy productivity
- create more integration between existing systems, thus eliminating redundant processing steps.

Maximize reliability and universal equality of access.

In its October 26, 2002 survey of digital security, the international news magazine The Economist, noted: “Computing, in short, is in the midst of a transition from an optional tool to a ubiquitous utility. One definition of a utility, indeed, is a service that is so reliable that people notice it only when it does not work.”

To give Lab employees the information they need to carry out their work effectively and efficiently, the delivery of technology-based services must become the equivalent of basic utilities as mentioned above (like water or electricity) with maximum reliability and universal equality of access. The recommended approach includes:

- provide researchers, staff, and management with seamless access to a variety of information, resources and services
- change from a collection of independent systems to a suite of integrated services
- allow for personalization of data delivery to meet individual requirements
- bring together information from sources inside and outside the organization.

Make information (not just data) readily available.

This is a change in perspective from transaction processing (such as payroll processing, which generates data used by administrators) to information delivery to scientific, managerial and operational end users throughout the Lab. Our approach will:

- cater to the needs of various end users (decision makers, business managers, PIs, analysts, administrators)
- integrate data from various sources and transform them into useful information
- provide for drill-downs from aggregates and for trend analysis over time
- establish a framework for decision making at an institutional level
- eliminate dependency on, and allow retirement of, locally developed and maintained applications and systems.

Move toward pervasive use of Web technology.

The Web will continue to play an ever-expanding role in the way we communicate, conduct business and carry out research. It is imperative that we not only respond to, but also effectively anticipate and identify opportunities to use the Web to better serve Berkeley Lab and its extended communities. Our approach will:

- replace legacy systems with integrated, Web-based applications that are both intuitive and serve the needs of the end users
- make institutional information easily accessible by authorized users ubiquitously over the Internet using a Web browser and single login
- expand staff self-service
- increase Web access to and from vendors.

Continue strengthening the information infrastructure and security.

Continued modernization of LBNL's current information infrastructure is essential to meet new demands, including constant increases in the volume of large datasets and growing reliance on local and remote network access. Appropriate levels of protection, recovery and continuity for all of the Lab's critical information systems and data must be maintained. Approaches adopted to date include:

- retire outdated technology to ensure continuity in service delivery and to lower operational costs
- continue to retool and upgrade to keep pace with advances in technology
- strengthen controls and protections in the IT application environments to prevent unauthorized access
- develop and implement an institutional business continuity plan to provide for disaster recovery.

These approaches have been adopted to ensure that the Lab's IT application infrastructure will provide the Laboratory community with information systems that are robust, reliable, accessible and cost-effective.

The continued implementation of distributed Web-enabled applications has fundamentally altered the economics and support requirements within the Lab. A suitable level of investment in the Laboratory's application infrastructure is essential whether or not this initiative proceeds. Without this investment, our efforts to deliver applications that provide seamless access to integrated institutional information, resources and services cannot be fully realized.

III. Major IT Projects FY 03-05: Scope, Objectives, and Benefits

In order to transform LBNL's information infrastructure and systems into an integrated system that meets the broad range of requirements of the Lab's staff, the Enterprise Computing Steering Committee proposes that a three-year IS initiative be launched to deliver new information, resources and services; capitalize on prior IT investments; and investigate new ways to meet emerging IT demands.

To achieve the overall goals of the IS initiative, the management team will ensure wide participation by the Laboratory user community. Rather than being a project of one department or division, the new efforts will be undertaken with a Lab-wide perspective. The project teams will work under well-defined project management structures to ensure that the work is completed on time and within budget. The result will be that end users of the information, whether a PI, a division director or an administrative assistant, will have access to essential information easily, quickly and confidently.

The major projects in the IS initiative are described below.

Deliver new information, resources and services:

- Develop Berkeley Laboratory Information Systems (BLIS)
- Select and implement a product data management system for Engineering

Capitalize on prior IT investments:

- Refine processes for a new suite of integrated Web-based funding/budget, timekeeping, and financial systems
- Leverage more capabilities out of PeopleSoft's HR application
- Create an efficient IT application environment
- Upgrade EH&S systems
- Upgrade and expand the use of Maximo
- Select and implement a system for job-applicant tracking

Investigate new ways to meet emerging IT demands:

- Evaluate office management systems for the Directorate and Division offices
- Assess content management software for Website development and maintenance

Many of the projects mentioned above and described in detail below respond to requests from users of the current services, while others are driven by internally identified opportunities for increased efficiencies.

Deliver new information, resources and services***Develop Berkeley Laboratory Information Systems (BLIS, FY 03-05)***

As currently envisioned, BLIS will provide LBNL users with a "personalized information cockpit," from which they can navigate and gain access to the management information they need with a few keystrokes.

This multi-year project is aimed at creating an integrated data warehouse with various service offerings, catering to the needs of all end users (decision makers, operational managers, principal investigators, etc.) by overcoming current systems' shortcomings and adopting industry best practices. The current systems have many shortcomings:

- Getting the data from the transaction processing systems (such as Payroll, Receivables and Billing) into the existing data warehouse is labor intensive. Homegrown programs used to "transform" data are prone to errors and are slower than commercially available tools. Deploying a commercial extract/transform/load (ETL) tool will greatly enhance the data quality and mitigate the need to maintain a large number of undocumented homegrown programs.
- Divisions maintain many shadow and local systems to produce division-centric reports that IT staff, due to resource constraints and current data warehouse design limitations, cannot create. The current reporting tool (Oracle Report) is cumbersome and cannot be used by the end users, nor can it produce charts and graphs for trend analysis and decision-making, while the complexity of the user interface makes the current system only useful to one type of user – analysts.

- Service offerings are not integrated. An integrated data warehouse with various offerings catering to the needs of all end users will enable managers (including PIs) to make informed decisions and increase operational effectiveness and efficiency.

Among the data to be included in the BLIS data warehouse will be budget, procurement, HR, travel, space and property. BLIS will allow Lab divisions to eliminate the various shadow systems still in operation. Not only will this free up the resources currently devoted to maintaining these systems, but BLIS will also ensure that the information is accurate and current, and allow users to enter subscriptions for customized data. BLIS will provide a customizable portal for accessing institutional information, services and resources. In addition to delivering the information seamlessly, BLIS will increase support for decision-making, replace incompatible legacy systems, and incorporate Web technologies for easier use.

BLIS's offerings will include:

- an integrated data warehouse consisting of Operational Data Stores, Data Warehouses and Data Marts
- a suite of reporting tools supporting ad hoc queries, predefined queries, standard reports and on-line analytical processing (OLAP)
- a suite of system portals (Reporting Portal, HR Portal, LBNL Enterprise Portal)
- an integrated information and service environment.

To provide world-class, Web-based services to employees of the Laboratory, it is vital for our Lab to have an HR portal that can integrate information technology systems, thus allowing employees direct access to institutional information, resources and services.

Whether drawing on our in-house technology base or using vendor-supplied components, we envision that the LBNL Enterprise Portal will include the functionality of the proposed UC New Business Architecture, including the following:

- common access to services via a Web browser
- authentication (who you are)
- authorization (what you are allowed to do)
- security
- personalization (presentation of information that pertains only to your work)
- services.

General information and services to be made available via the enterprise portal, in addition to accessing Web-based IT applications, would include:

- news, Laboratory updates, targeted announcements, email, personal calendars, special events
- Laboratory directories, dictionaries, maps, libraries

- benefits (Bencom), personnel records, online purchases, online training, parking permits, job bulletins/job searches
- Employee Activity Association events and related cultural activities
- local weather, BART schedule, approved outside websites for employee access (e.g., FranklinCovey, Fidelity Investment).

Select and implement a product data management (PDM) system for Engineering (FY 03-04)

The purpose of product data management (PDM) systems is to dynamically and expeditiously exchange and manage product and/or project data across multiple workgroups in a secure, seamless and transparent fashion. This type of system helps maintain business continuity as resources and personnel change over the lifetime of a given project. Engineering is in need of such a system to manage the life cycle of engineering and design, and to integrate data formats produced by dissimilar CAD systems, as well as other data formats used at the Lab.

This project calls for documenting discipline-specific requirements of the Engineering Division and facilitating the selection of a comprehensive PDM system for Engineering's use.

The assessment of the requirements for such a system and the subsequent implementation require a significant change in the way the Engineering Division conducts business. A successful implementation would require documented policies, procedures, processes, and operating practices that will govern how designs migrate throughout the design and development life cycle, irrespective of project boundaries. Additionally, a cross-functional, multi-discipline team would have to be put in place to champion this implementation throughout the division.

The benefit to Berkeley Lab is that individuals in management roles can have access to data currently generated by various applications that require a significant learning curve to understand how to use them, without the overhead of having to learn the nuances and functionality of those applications. Without these types of information systems, data becomes localized and visible only to the users of the applications that generated the data.

Capitalize on prior IT investments

Refine processes (FY 03) for a suite of new Web-based integrated funding/budget, timekeeping, and financial systems (FY03-04)

Berkeley Lab can increase its efficiency by taking the current systems and refining them, in the process redefining how work should be carried out at the Lab (FY 03).

Past over-customization of package software has made it time-consuming and expensive for LBNL to upgrade to new versions, thereby locking the Lab into out-of-date (and less capable) versions. Now that the Lab has automated many business activities, we need to realign them around the core business processes, simplify those business processes, perform “fit-gap” analyses against the latest versions of available software, and re-implement those latest versions with well-defined and minimal customization.

Rewrite of the Program Management and Tracking System (PMTS, FY 03)

The current Program Management and Tracking System (PMTS) was developed in the late 1990s by programmers at Oak Ridge National Laboratory using early generation Web development tools and techniques. The programming methodology used to write the system, which was state-of-the-art when it was designed, is now obsolete due to the rapid advancements in Web authoring technology. This project is aimed at reducing long-term management costs and increasing the Laboratory’s flexibility to enhance and integrate PMTS by rewriting it using modern Web-based development tools. Once this foundation has been established, the system’s reliability can be improved and specific enhancements and integration points added to the system as needed.

The improved system foundation will provide Financial Services with the flexibility to be more responsive to the needs of the divisions by enabling rapid development of enhancements at a lower cost. Improvements to the applications integration layer will facilitate the development of integration points to other institutional systems, which will lead to the reduction in redundant data entry, as well as creating opportunities for the consolidation of the Laboratory’s budget formulation and institutional planning information. This will also create opportunities for enhanced integration and streamlining of DOE reporting processes.

New Funding/Budget System (FY 04)

One of the goals of the 1995 IT strategic plan was to provide a centralized funding and budget system – this was the number one need and want of the divisions. The Lab decided to develop an in-house system (Janus) after a survey of off-the-shelf applications and Lab software developers determined that none of the commercially available software packages met LBNL’s needs. Janus, as designed, supports LBNL’s budget process but does not fully meet the Lab’s needs.

The results of a recent survey of division managers, PIs and administrative staff (see Appendix G for list) indicated that building a new funding/budget system and a complementary reporting system such as BLIS are the divisions’ top priorities. It’s now time to build this central suite of systems in the context of streamlining existing funding and budget processes.

New timekeeping system (FY 04)

Back in 1992, the Lab was not satisfied with the Time and Attendance module of PeopleSoft, so LETS – the Lab-developed time inputting system – was developed. As long as the Lab uses this home-grown product, LETS will have to be customized and re-interfaced to accommodate each PeopleSoft Payroll system upgrade, which is costly. LETS needs to be reviewed in the light of seven years of commercial software development since it was deployed and replaced with a modern timekeeping system.

Electronic timekeeping is now a robust process done across the U.S., and the Lab should be able to find the appropriate system from an outside vendor.

Upgrade PeopleSoft Financials to Release 8.4 (FY 04)

The Lab needs to upgrade our financial suite of PeopleSoft applications (General Ledger, Projects, Billing, Accounts Receivable, Purchasing, eProcurement, Accounts Payable, and Grants) from version 7.5 to the current version – 8.4. This upgrade must be completed before January 2005 in order for the Lab to retain the vendor's support. In addition to a transition from client-server based architecture to Web-based architecture, there will be numerous functionality enhancements and refinements resulting from the process refinement mentioned above.

Version 8.4 will provide integration between the General Ledger and Projects modules that may render current customizations unnecessary. Version 8.4 will lead to greatly enhanced integration between our Purchasing and eProcurement systems. Version 8.4 also combines the commercial and Education & Government product lines, which will lead to enhanced integration with the PeopleSoft HRIS. For commitment control, 8.4 will provide the ability to budget-check transactions against budget balances that are cumulative across multiple budget periods. A greatly enhanced chart of accounts capability will create opportunities for enhanced DOE funds tracking and control. Elimination of past customizations and streamlining of current processes, combined with the expected system improvements, will significantly increase system maintainability, flexibility and usability. This should also translate into a reduction of ongoing operational costs

Leverage more capabilities out of PeopleSoft HR applications (FY 03-05)

The PeopleSoft HR modules listed below have not yet been installed. The 5-year strategy in HR is to take full advantage of these untapped capabilities and integrate them with other resources. The modules are:

- Benefit Billing
- Budget Training
- Career Management
- Career Planning
- Competency Management
- Health and Safety

- Manage Labor Relations
- Monitor Absence
- Position Management
- Succession Management.
- Global Assignment Tracking

In resurrecting these HR modules, the Laboratory will be able to take a more strategic view, both short-term and long-term. For instance, it is important to look ahead to the kinds of scientific projects the Lab wants to be engaged in, and look at the kind of people LBNL will need – by demographics, skills sets and education – and see where there are going to be gaps. We should look three to five years out and look at the organization, department by department, to assess those needs and how to meet them. Currently, the Lab does not have the tools to accomplish this. But resurrecting the PeopleSoft Position Management and Career Planning modules and integrating the information from these systems with Finance, salary information, market salary surveys and skills inventories, the Lab could move in that direction. It would help employees, supervisors, and senior management all develop a process that would take everything into account to determine the competencies we want to develop.

This will allow the Lab to do a better job of identifying, retaining and hiring the kind of people we will need to support our scientific expertise. It would put the Laboratory at the front edge of workforce innovation – the same place we are in when it comes to scientific research.

Create an efficient IT application environment (FY 03-05)

The Laboratory can strengthen the existing IT application environment and provide LBNL with a software development, maintenance, and production control process that more closely resembles industry best practices by implementing projects such as those listed below.

Create an IT testing environment mirroring production systems(FY 03)

LBNL does not have a dedicated systems test environment where IT applications and integrated software components can be isolated for testing prior to production rollout. The lack of a separate test environment reduces the effectiveness of change management and security controls. This leads to situations where testing is carried out in production. It also creates an unnecessary risk when new applications, systems enhancements or fixes are introduced into production.

Effective change management and secure segregation of the IT production computing environment are extremely important from both operational and security standpoints. The introduction of a separate testing environment will enhance the existing security and change management controls, and improve testing. A properly segregated test environment mirroring the production environment will allow full volume-user

acceptance testing and limit developer access to user authorized/tested programs prior to production implementation, thereby ensuring the integrity of production programs and data.

Implement change request tracking (FY 03)

Berkeley Lab does not currently have a centralized change management system capable of accepting, tracking, and disseminating status information for change requests. All changes to the LBNL information infrastructure and systems must be properly managed, because all changes in principle have a potential impact on the level of services provided. Without a centralized change request tracking system, requests for changes are initiated from a number of disparate sources and there is no common control mechanism in place to prevent potentially conflicting or duplicated requests from being accepted and processed. There is also no standard method of tracking user-generated requests or guaranteeing that these types of requests will be correctly picked up, prioritized and scheduled. Furthermore, there is no standard method of communication back to the requestor or other interested parties regarding the ongoing status of their request for change.

To ensure the smooth processing of requests for change, it is essential that during the request's lifetime, it can be monitored and its status tracked from initial input to resolution. These safeguards help to ensure that changes are either disposed of or implemented in the right place at the right time and are free from defects. Comprehensive change request tracking increases the visibility of potential changes, helping to ensure that their potential implementation impact is understood by all affected parties. A properly implemented request tracking system also helps to validate the methodology of the development and testing process.

Assess new production scheduling software (FY 03-04)

Berkeley Lab does not currently have a centralized job scheduling system capable of integrating our production application batch processing with the existing PeopleSoft batch scheduling software. PeopleSoft has a built-in workload scheduling tool called the PeopleSoft process scheduler. This scheduler provides basic job execution functionality for end-users to submit, launch and track job requests to completion. In order to provide a single point of control for all production job submissions, the Lab needs to integrate the existing production workload scheduler with the PeopleSoft process scheduler, thereby leveraging the overall functionality that exists within both schedulers.

A centralized job scheduling system would provide a single point of control for scheduling and monitoring regular system batch as well as ad hoc job execution requests. The requisite scheduling tool must provide a broad range of job controls and constraints along with a common operator interface. It must be able to handle both cross-platform and cross-application dependencies and provide sufficient real-time

and historical monitoring components to allow comprehensive tracking of jobs and job sets.

Upgrade EH&S systems (FY 03)

Berkeley Lab currently utilizes several systems to stay in compliance with state and federal regulations concerning environmental, health and safety issues here. EH&S provides a strong case for reducing the technical and business complexity to make the end users' jobs easier with the following planned system efforts:

Chemical Inventory System Phase II

EH&S has just completed an upgrade of its Chemical Inventory System to the Web. Phase II of the effort is aimed at providing additional functionality, including increased compliance reporting capability, and links to other applications. This will enable EH&S to respond to new reporting requirements from DOE, auditors, and other regulatory and oversight agencies, such as the City of Berkeley, the State Department of Toxic Substances Control, East Bay Municipal Utility District, Bay Area Air Quality Management District, etc. A new hazard tracking functionality is also being added in response to the needs of researchers and emergency response agencies.

Convert RADAR to Web interface

The current paper system of RADAR (Radiation Authorization Data and Report) leads to delays, increased data transcription errors and poor data quality. Conversion of the front end to a Web-based version will improve ease of use. It will also eliminate desktop support and Microsoft Access issues which have been problematic in the past.

The Web-based interface will allow for timely updates from the user, prompt review of protocols and accurate compliance reporting. 10CFR835 – Radiation Protection compliance is managed using the RADAR system. Control of radioactive material inventory, updates, and tracking are critical parts of the program. Direct user updates and verification of accountability will be possible with the Web-based interface.

Upgrade and expand the use of Maximo (FY 03-05)

Maximo, a commercial software application used by Facilities to manage a large portion of its business, has revolutionized Facilities and has been pushed out to other Lab organizations as its advantages become apparent. For instance, the welding and metal shops in Engineering are using the application on jobs done for Facilities. And, the Hazardous Materials database maintained by EH&S has been brought into Maximo and the database upgraded. Contract labor has also been added. The current Sunflower property record system is scheduled to be replaced by Maximo (FY 04). It

is recommended that any Lab organization that has any type of property or storage management system use Maximo (FY04-05).

Furthermore, Facilities hasn't yet tapped all of the capabilities of Maximo. The planned activities include:

Implement Maximo Release 5 (FY 03)

This project entails the installation and implementation of a completely reengineered and redesigned Maximo system. Maximo Release 5 represents a paradigm shift, moving from client-server to a Web-based system.

Implement Maximo Work Manager (FY 03)

Maximo Work Manager leverages Maximo's built-in resource calendar to produce a planning and assignment scheduling tool for supervisors to manage work activities. Activation of this feature will help eliminate the existing paper-based and person-based process and optimize daily work scheduling and tracking processes.

Select and implement a system for job-applicant tracking (FY 03)

PeopleSoft no longer supports our current applicant tracking system (ATS), Webhire Resume Reader. As we upgrade to newer versions of PeopleSoft HR applications, it will become increasingly costly to make it compatible. In addition, the lack of desired functionality in the current system makes it difficult for recruiters and HR Center staff to carry out the recruitment process effectively or efficiently. A new ATS will make it easier and quicker for divisions to hire new staff.

This system will provide recruiters and HR Center staff with the ability to open job requisitions, screen applicants, route applicants to job requisitions, make offers to applicants, hire new staff, and provide appropriate reports – all with a single system. Additionally, improved reporting capabilities will enable the Lab to more easily analyze data from trends in order to ensure that we are meeting the Laboratory's strategic staffing needs.

Investigate new ways to meet emerging IT demands

Evaluate office management systems for the Directorate and Division offices (FY 03-04)

Document Management Software

There is a need for a comprehensive system that could help manage the receiving, routing, action tracking, archiving, and retrieval of the documents (paper

correspondences, email messages, power point presentations, etc.) coming to and from the Directorate and Division offices. The system must support:

- scanning and keeping an image of the paper document
- indexing documents by subject, date, organization, etc.
- routing to others for action
- posting comments on the document
- tracking the related resolution, if any
- searching by keyword, phrase, or full text
- archiving based on status
- retrieval with no latency
- enhanced security for or private notes or confidential information
- Web interface that works with both Netscape and Internet Explorer.

Work-group collaboration software

There is also a need for a work-group collaboration software, providing a digital workplace for accomplishing day-to-day work by cross-functional teams to plan, execute and control projects or implement new processes. The desired state includes workflow and conferencing functions. The system must be able to:

- provide multi-level access control to documents using multiple permission levels
- provide non-member access as needed.
- track document version history and event history (audit trails)
- create tasks that are attributable to a user or a group
- allow annotations/markups
- check in/check out documents to maintain integrity
- send change notification to automatically alert users of changes
- support “recycle bin” type deletion and allow an administrator to restore a deleted file
- allow powerful searches, including text inside of all document formats (doc, pdf, ppt, xls, etc.)
- manage content in its native format, such as Microsoft Word
- deliver PowerPoint files as a slide show
- support on-line messaging between members in the workspace
- send email to a project team
- drag-and-drop for file sharing
- upload files
- integrate with Microsoft Office and LDAP directory
- support browser-based client access with login
- work with both Internet Explorer and Netscape browsers

- view instant HTML renditions of documents in multiple file formats

Assess content management software for Website development and maintenance (FY 05)

To reduce the operational costs of maintaining its thousands of Web sites and to help staff provide users with the most up-to-date and accurate information, the Lab should consider revamping how LBNL Web pages are being developed and maintained. Today, Web pages are created in various Laboratory organizations in a silo fashion. The “look and feel” is created more from an organizational perspective rather than with an eye toward the needs of the end users. And, tools used vary depending on the local expertise. A centrally maintained content management system would allow various Laboratory administrative and scientific organizations to contribute to building Web pages from an end-user perspective. For instance, a Web page created for new hires to search for HR-related information, could also include information on EH&S, computer support, transportation and the RPM.

Such an approach is outlined in the UC New Business Architecture. Generically, content management software can be used to organize Web page contents, as well as to automate Web page administration and content submission. Access to the content management tools can be role-based, allowing numerous content providers (TEID, PIs, researchers) to securely update only the information in their area of responsibility. It’s important to note that providing tools to help manage content does not translate into centralized control of content.

IV. Conclusion

Progress made toward full completion of the 1995 Strategic Plan is evidenced by the go-live of the PeopleSoft Accounts Payable, Purchasing, and eProcurement systems on August 5, 2002, and the planned implementation of the new PeopleSoft Grants Administration (Phase I) and Travel systems in FY 03. When these systems are fully implemented, the Laboratory’s critical financial systems will all have been modernized. This huge success in modernizing transaction-processing systems now provides a strong foundation for LBNL to start The Next Leg of the Course.

As the Lab is poised to take its modern IT infrastructure and systems to the next level, it’s a good time to see how far we have come: Beginning in 1995, the Lab embarked on the IT Shakedown Cruise. At the outset, our systems were so archaic that every payroll was an adventure. Some of our accounting operations were running off-site because LBNL did not have the equipment or staff to support the software and languages that were being carried over from past decades. Then, Berkeley Lab automated activities based on the best software that was available. Now that the foundation is built, the Laboratory needs to work on integration, process definition

and refinement, and reporting. It is the reporting and operational efficiencies that will make the improvements valuable to the scientific divisions.

There needs to be accountability for the projects, but there also needs to be dedicated funding to complete the work. The budget for the proposed projects should include the development and start-up costs, contingency, ongoing annual operation and maintenance costs as well as the training costs. The Enterprise Computing Steering Committee recommends that \$2.5 million be allocated annually for the next three years to implement this IS plan. The challenge is to recognize that this is a strategic investment for the long term. There will very few immediate returns, but the investment is expected to pay large dividends over the years to come. With that dedicated funding, along with the dedicated support of the Operations and scientific organizations of the Lab, this initiative will provide LBNL with an information infrastructure every bit the match for its intellectual infrastructure.

V. Appendices